



Urological Working Place

The present invention relates to a urological working place according to the generic clause of claim 1.

A urological working place of the type in question comprising an X-ray source at the upper end of a so-called U-bow and a radiation reception array at the lower end of the U-bow is known e.g. from DE-pat. 198 43 680.

The examination table for the patient is there fixedly attached to the U-bow. The examination table is located between an X-ray examination unit comprising an X-ray source and a radiation reception means. The X-ray examination unit is here displaceable relative to the examination table in the x- and in the y-direction. The individual components of the X-ray examination unit are adapted to be moved individually, preferably, however, in synchronism with one another. In the case of a vertical adjustment of the U-bow, the examination table is vertically moved as well. When the U-bow is tilted, the examination table is tilted as well, without any change in the relation between the examination table and the X-ray examination unit. The tilting axis extends approximately through the examination table. This is definitely advantageous for examinations in the case of which the gravity-dependent flow behaviour of contrast media in the patient's urotract is to be diagnosed, but it is disadvantageous when said urological working place is to be used for carrying out a lithotripsy.

This disadvantage is that, when a lithotripsy is being executed, the location of the concretment to be destroyed must be found in the patient's body; for carrying out this locating step, the U-bow must be tiltable independently of the examination table and the tilting axis of the U-bow must extend through the patient's body.

It is the object of the present invention to design a urological working place known according to the generic clause of claim 1 in such a way that it can also be used for a therapeutical treatment by means of lithotripsy, in addition to its diagnostic and indicatory functions.

This object is essentially achieved by the characterizing features of claim 1. When the attending physician executes the locating steps, these features permit, in a surprisingly simple manner, a displacement of the X-ray beam by displacing the respective radiation source

on the tilted U-bow in the x-direction into the focus of the therapy head of an adjacent lithotripter so as to re-establish the isocentre of the therapeutical beam (lithotripter) and of the X-rays in the tilted condition of the U-bow.

The special advantage of the present invention is to be seen in the fact that an already existing urological working place can also be turned into a lithotripter comparatively fast and with little technical and economic expenditure. It follows that the acquisition of an expensive, independent lithotripter working place can be avoided in many cases by the present invention.

As far as the examination table is concerned, it is, within the framework of the present invention, only necessary that said examination table is preferably adjustable in the x-y direction and that it has a lateral recess for unhindered use of the lithotripter.

The additional claims relate to further developments and/or particularly advantageous embodiments of the subject matter of the present invention.

The invention is graphically explained on the basis of an embodiment in the figures, in which

Fig. 1 shows a front view of a urological working place that has been turned into a lithotripter, the U-bow being tilted from its vertical starting position to the right through an angle of substantially 25°.

Fig. 2 shows the side view seen in the direction of sight A according to Fig. 1.

Fig. 3 shows a perspective view of a lithotripter according to the present invention as disclosed in Fig. 1 and 2.

Proceeding from a urological working place, the medical apparatus according to Fig. 1 to 3 has a so-called U-bow 1. The U-bow essentially comprises a U-shaped carrier which is tiltable mounted on a base frame 2 in a support, with the axis K. The axis K extends horizontally in the vertical centre plane 3 of the U-bow 1 and, when seen in the vertical direction,

below the support plate 13 of an examination table 7, the examination table being releasably secured to said U-bow.

The upper end of the U-bow has arranged thereon, in a manner known per se, an X-ray source 5 which co-operates with an image processing means 4 at the other end of the U-bow 1. The X-ray source 5 and the image processing means 4 define together an X-ray unit.

According to the present invention, the working place has associated therewith a therapy head 6 of a lithotripter whose focus F is positioned above the examination table 7 in the centre plane 3; at the vertical position of the U-bow, the focus F also intersects the central line 8 of the X-rays. When the U-bow 1 is tilted about the axis K, the central line 8 of the X-rays is pivoted away from the focus F. For executing the second locating step at the patient, the X-ray source 5 and, in synchronism therewith, the image processing means 4 are, according to the present invention, displaced on the U-bow in the x-direction, i.e. parallel to the support surface of the X-ray source 5 and the support surface of the image processing means 4 on the U-bow, until the central line 8, which represents the central ray of the X-ray unit, intersects the focus F again. The X-ray source and the image processing means are adapted to be displaced relative to the U-bow individually and also synchronously in the transverse direction.

In the embodiment of the present invention shown in the figures, the U-bow 1 is tilted about the axis K through an angle of substantially 25° in the course of the locating process, whereupon the units 4 and 5 are displaced on the U-bow by approx. 140 mm in the x-direction.

For fixedly positioning the therapy head 6 within the working place, the U-bow 1 has provided thereon a preferably circularly bent guide segment 9 whose centre is positioned on the tilting axis K as well. Making use of an arm 10 and a slide 11, the therapy head 6 can in this way be guided on the guide segment 9, which is secured in position on the U-bow, in frictional and/or in positive engagement therewith and it can be retained at its original position by means of a holder 12 secured to the base frame 2, when the U-bow 1 is tilted about the axis K.

As can additionally be seen from the figures, the support plate 13 of an examination table 7 is located between the focus F of the therapy head 6 and the axis K. A simple relax bed can preferably be used for this purpose within the framework of the present invention. For executing locating steps at the patient, it may, however, be of advantage to implement the support plate 13 such that it is vertically adjustable. This type of adjustability can, in a manner known per se, be realized in the legs of the examination table 7. Since such adjustment possibilities are known in the field of technology to a sufficient extent, a graphical representation thereof has been dispensed with.

In view of the fact that the U-bow is vertically adjustable, it is also possible to use a bed which is not vertically adjustable. An adjustability of the bed in the x-y direction is, however, indispensable.

Finally, for the use of a therapy head 6, it may, within the framework of the present invention, be useful to provide, for structural reasons, a semicircular recess 14 on the support plate 13 in the area of use of the therapy head 6, so as to guarantee an unhindered use of the lithotripter.